

process. Applicants have amended the Abstract by including steps of the claimed invention, therefore applicants request that the Examiner withdraw this objection.

Claim Objections

Claim 4 has been objected to under 37 CFR 1.75(c) as being of improper dependent form for failing to limit the subject matter of a previous claim. The Examiner contends that claim 4 does not further limit claim 1 because claim 1 states that "said stripping gas is hydrogen" and that such language indicates that the stripping gas is 100% hydrogen. The Examiner concludes by saying that therefore the limitations of claim 4 that the stripping gas comprises no more than ½ mole percent hydrogen sulfide and no more than 50 mole % hydrogen does not further limit claim 1.

Claims 1 and 4 have been amended by requiring the stripping gas is a gas stream comprising hydrogen. Such language, in U.S. Patent Law means that the stream does not have be 100% hydrogen, but can contain other components. Such hydrogen containing streams are well known in the refinery art. Therefore, it is requested that the Examiner reconsider and withdraw this objection.

Rejection Under 35 U.S.C. 112

Claims 1-14 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention. The Examiner believes that claims 1-14 are indefinite because it is unclear to the Examiner which catalyst is used when hydrogen is the stripping gas. The Examiner points to claim 1, lines 9-11, wherein the Examiner believes that the catalyst can be one of two types when hydrogen is the stripping gas and in line 12 the catalyst is one type when hydrogen is the stripping gas .

The Examiner also points out that claim 7 contains the trademark "SCANfining".

Applicants' Position

Applicants have amended claim 1 so that it is now clear that when the stripping gas is an inert gas the catalyst can be a Group VIIIB metal promoted Group VIB catalyst. When the stripping gas is a hydrogen containing gas the catalyst can be either a non-reducible metal oxide or a Group VIIIB metal promoted Group VIB catalyst. Support for this can be found in the last paragraph of page 5 of the instant specification.

Claim 7 has been amended as indicated by deleting the term "SCANfining" and replacing it with a definition selective hydrodesulfurization.

First Rejection Under 35 U.S.C. 103

Claims 1-4 and 8-13 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Harandi (U.S. 5,554,275).

It is the Examiner position that Harandi discloses a process for desulfurizing a hydrocarbon feed by passing a liquid hydrocarbon into a stripper having a bed of hydrodesulfurization catalyst and contacting the liquid with the catalyst while passing a stripping gas (i.e., hydrogen) into the stripper. The Examiner also mentions that the catalyst used in Harandi can be a Group VI and VIII metal catalyst such as cobalt-moly on a support such as alumina. The Examiner also states that Harandi does not disclose the presence of mercaptans or the composition of the stripping gas, but that it would have obvious to one of ordinary skill in the art to have modified the Harandi process by using a feed that contains mercaptans and using the stripping as instantly claimed.

Applicants' Position

The teaching of Harandi does not suggest the instantly claimed invention. The Harandi teaches a process for hydrogenating and stripping a volatile light hydrocarbon liquid stream containing C₃+ aliphatics including at least one sulfur compound to remove lower boiling components and convert the organosulfur compound, thus producing

hydrogen sulfide which can be stripped. The claims, as now amended, require that the feedstream be an olefinic naphtha stream. This is clearly outside the teaching of Harandi. Therefore, it is requested that the Examiner reconsider and withdraw this rejection.

Second Rejection Under 35 U.S.C. 103(a)

Claims 5 – 7 and 14 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Harandi as applied to claim 1, and further in view of Jossens et al. (U.S. Patent No. 6,228,254).

Jossens et al. is cited as disclosing a mild hydrotreatment that results in a hydrotreated stream that still contains mercaptans but these mercaptans can be removed with further treatment. The Examiner believes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Harandi by hydrotreating a hydrocarbon to produce the feed as suggested by Jossens because the initial mild hydrotreating of Jossins retains olefin content while increasing mercaptan.

Applicants' Position

Applicants have already discussed Harandi which does not teach treating the same type of stream as instantly claimed.

Jossins et al. teaches a two step mild hydrotreatment process wherein a sulfur-containing stream is hydrotreated under mild conditions to increase the level of mercaptans, which are then removed by use of a solid absorbent in a second step.

The process of the instantly claimed invention does not increase the level of mercaptans followed by absorption for their removal. The instantly claimed invention first decomposes the mercaptans, then strips the resulting sulfur containing gaseous product from the hydrotreating unit. Applicants contend that one having ordinary skill in the art looking to decompose mercaptans would not look to art that in fact produces mercaptans in a first step.

Therefore, it is applicants' position that the Harandi patent does not teach treating the feedstreams as instantly claimed and that the Jossins et al. patent teaches away from the decomposition of mercaptans in first step.


Applicants request that the Examiner reconsider and withdraw this rejection.

Applicants' attorney notes that other art has been made of record but has not been cited against the instant claims.

For the foregoing reasons applicants believe that the claims, as now presented, define a patentable invention over the cited art. The Examiner is encouraged to pass this application to allowance and to call the undersigned attorney should the Examiner have any questions.

Respectfully submitted,

Date: 3 April 2002


Gerard J. Hughes
Attorney for Applicants
Reg. No. 41,855
Tel. No. (225) 977-4942

(Address to which correspondence is to be sent)

ExxonMobil Research and Engineering Company
P.O. Box 900
Annandale, NJ 08801-0900



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APR 10 2002
TC 1700

Marked-up Version of Claims Accompanying Response to

First Office Action for 09/676,875

1. (Once Amended) A method for decreasing sulfur levels in a mercaptan sulfur containing olefinic naphtha [hydrocarbon] feedstream comprising the steps of passing said mercaptan sulfur containing olefinic naphtha [hydrocarbon] feedstream over a fixed bed catalyst in a three phase, gas, liquid, solid, system in the presence of a stripping gas, for a time and temperature and pressure sufficient to decompose at least a portion of said mercaptans to produce olefins, H₂S[,] as an off gas, and a hydrocarbon product stream having decreased amounts of mercaptan sulfur from and to disengage said hydrocarbon product stream having decreased amounts of mercaptan sulfur from said H₂S and said stripping gas and wherein said stripping gas is a gas stream comprising hydrogen, said fixed catalyst bed comprises (a) a non-reducible metal oxide or (b) a Group VIIIB metal promoted Group VIB catalyst, and wherein said stripping gas is an inert gas [or hydrogen], said fixed bed catalyst comprises a Group VIIIB metal promoted Group VIB catalyst.

4. (Once Amended) The method of claim 2 wherein when said stripping gas is a gas stream comprising hydrogen and said catalyst is a Group VIIIB promoted Group VIB catalyst, said stripping gas comprises no more than ½ mole % hydrogen sulfide and no more than 50 mole % hydrogen.

5. (Once Amended) The method of claim 1 wherein said mercaptan sulfur containing [hydrocarbon] olefinic naphtha feedstream is a hydrodesulfurized feedstream.

6. (Once Amended) The method of claim 1 wherein said method includes a hydrodesulfurization step to produce said mercaptan sulfur containing [hydrocarbon] olefinic naphtha feedstream.

7. (Once Amended) The method of claim 6 wherein said hydrodesulfurization step is a selective hydrodesulfurization step wherein sulfur is

removed without substantially saturating olefins and without substantially changing the octane number.

12. (Once Amended) The method of claim 1 wherein said mercaptan sulfur containing [hydrocarbon] olefinic naphtha feedstream contains less than 30 ppm of non-mercaptan sulfur.

13. (Once Amended) The method of claim 1 wherein said mercaptan sulfur containing [hydrocarbon] olefinic naphtha feedstream contains less than 30 ppm of non-mercaptan sulfur and greater than 30 ppm of mercaptan sulfur.